

EuroValve

March 10-11, 2016

Do not Forget Left Ventricle in Valvulopathies

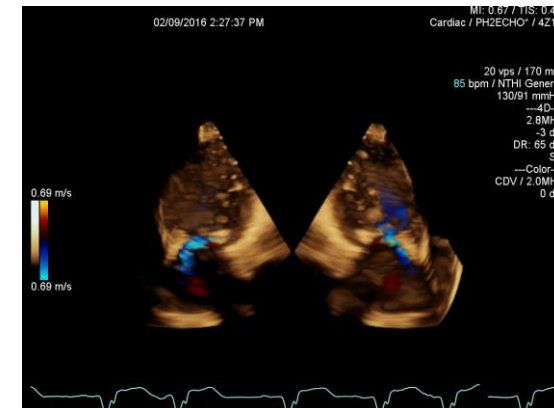
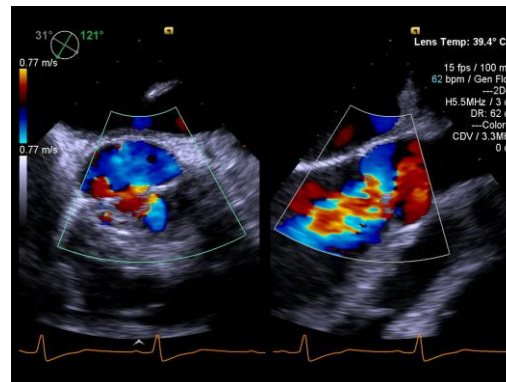
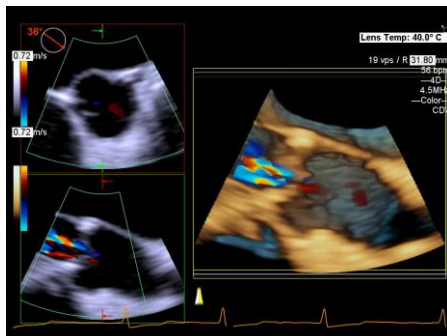
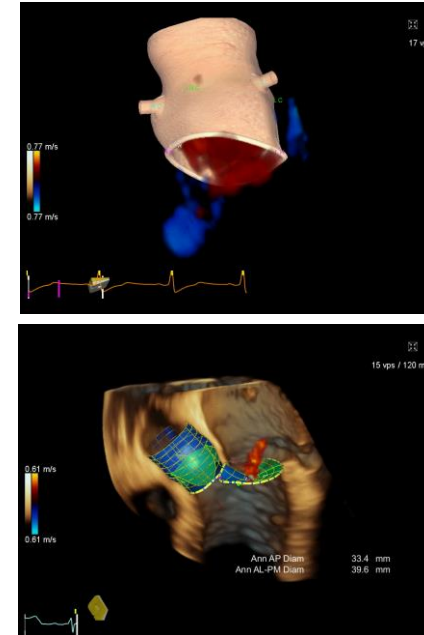
Dr Julien Magne, PhD
CHU Limoges, France



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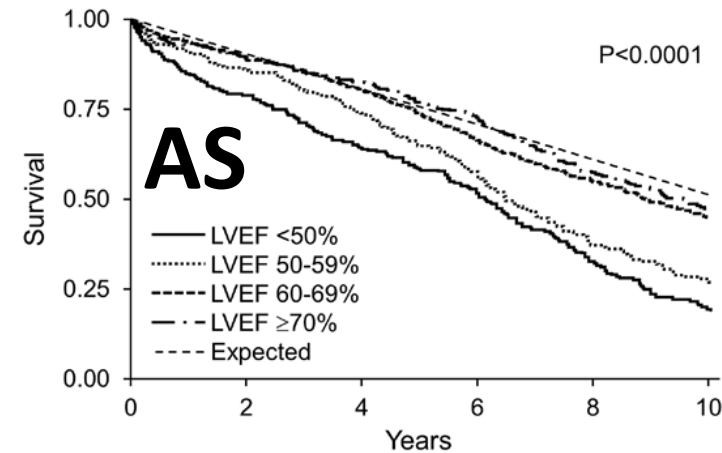
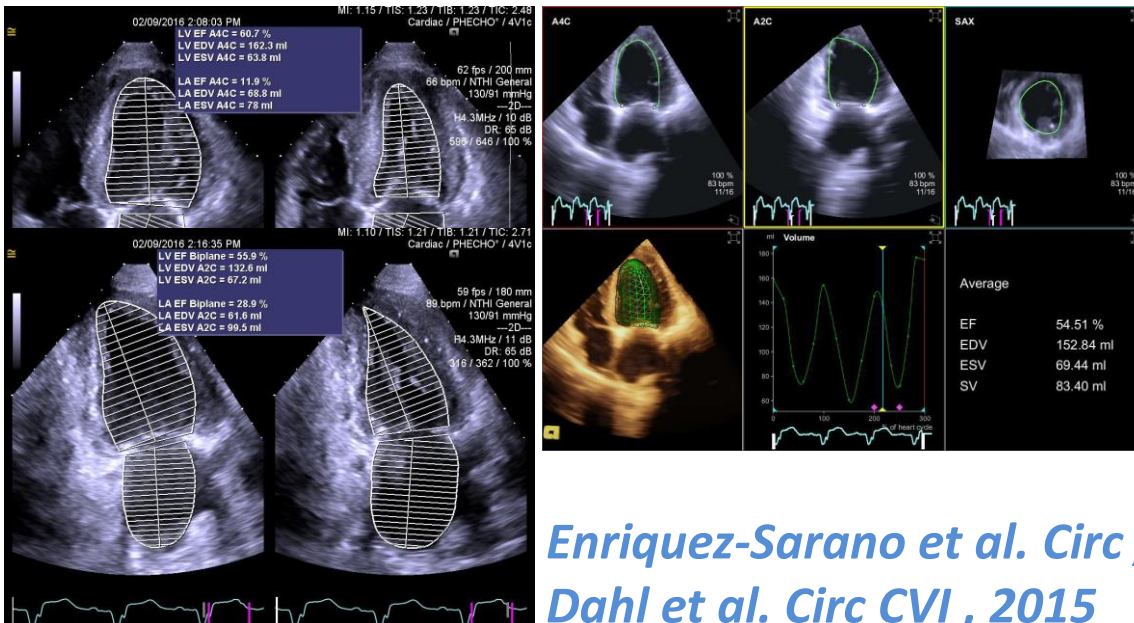
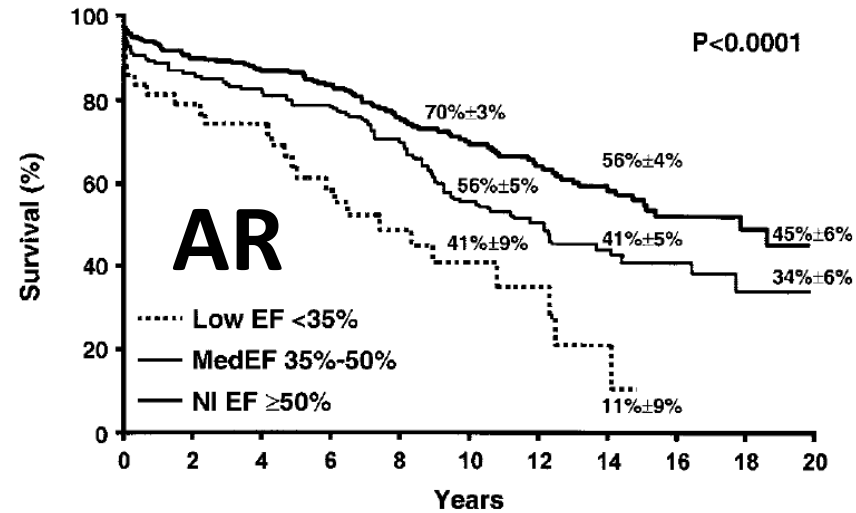
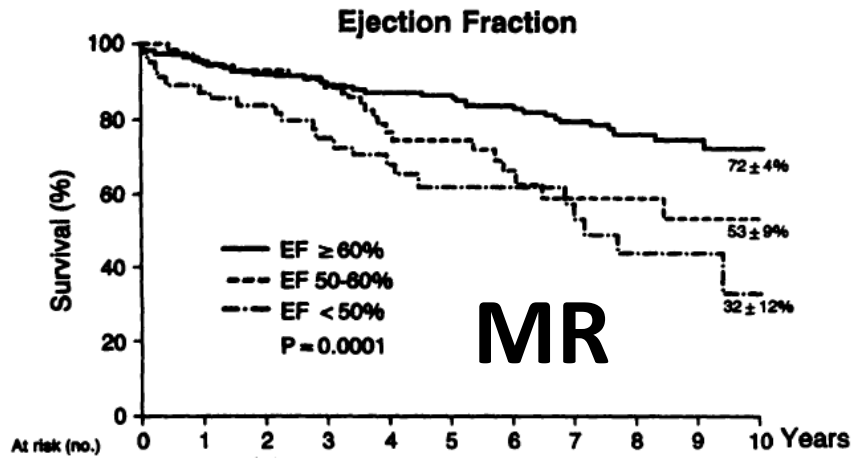
The Place of LV Function in Guidelines

		2012 ESC	2014 ACC/AHA
AS	Asymptomatic, LVEF<50% (C2)	I, C	I, B
	LVEF>50%, excessive LV hypertrophy without HT	IIb, C	...
	Severe LF/LG, LV dysfunction, no flow reserve (D2)	IIb, C	IIa, B
MR	Asymptomatic MR, LVESd>45mm, LVEF<60% (C2)	I, C	I, B
	Symptomatic LVEF>30%, LVESd<55mm (D)	I, B	I, B
	Symptomatic LVEF<30%, LVESd>55mm (D)	IIa, C	IIb, C
AR	Asymptomatic AR, LVEF<50% (C1)	I, B	I, B
	Asymptomatic AR, LVEF>50%, Severe dilatation (C2)	IIa, C	IIa, B



Vahanian et al. EHJ, 2012
Nishimura, Otto et al. JACC, 2014

LVEF in Valvular Heart Diseases



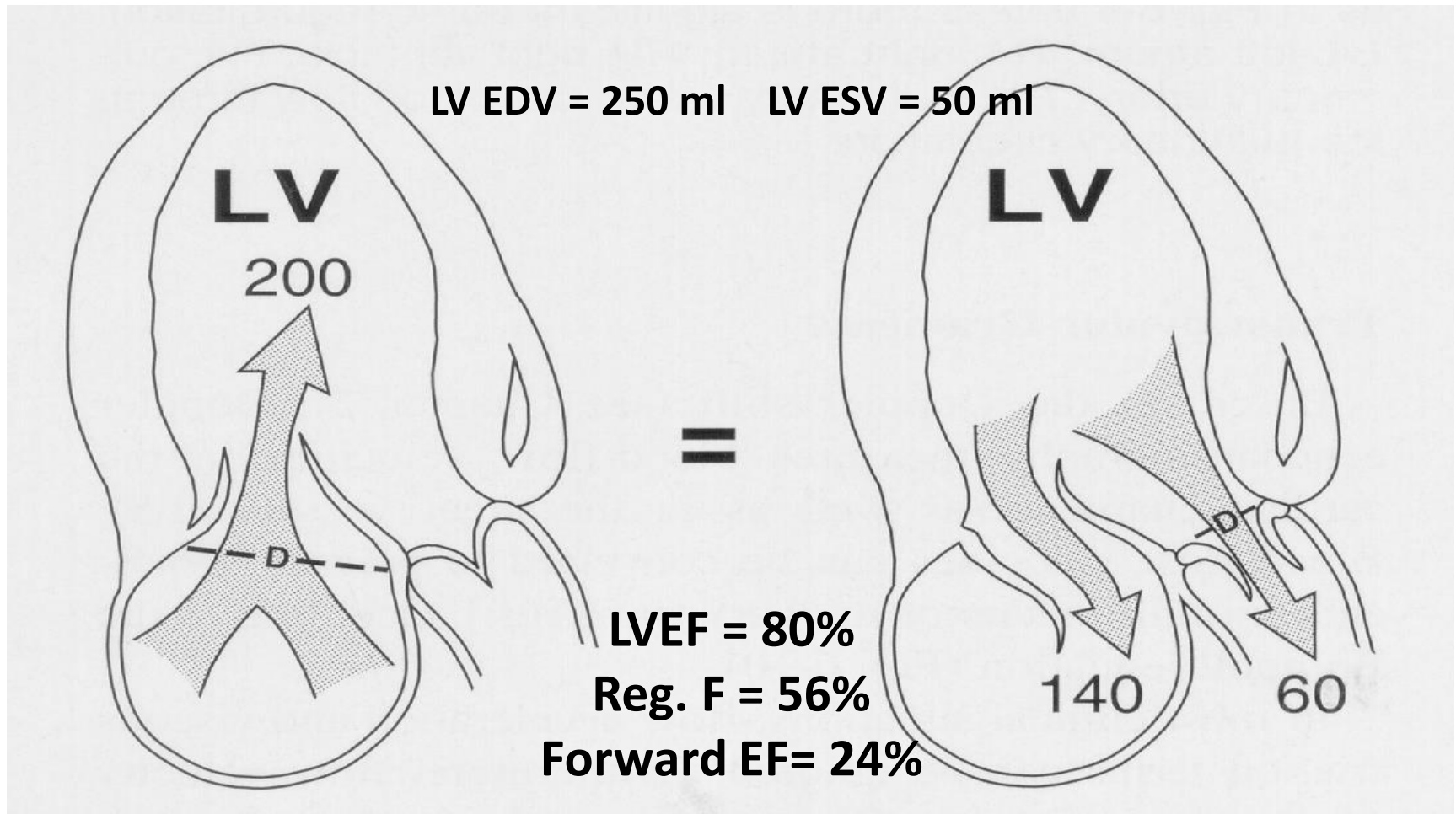
Enriquez-Sarano et al. *Circ*, 1994

Dahl et al. *Circ CVI*, 2015

Chaliki et al. *Circ*, 2002

LVEF in Patients with MR

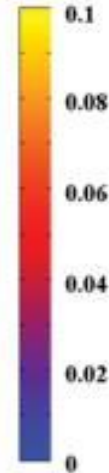
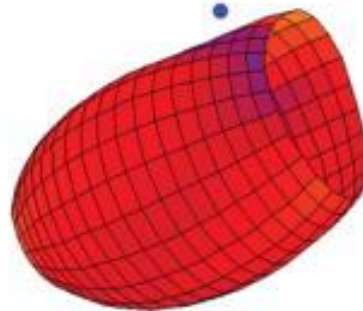
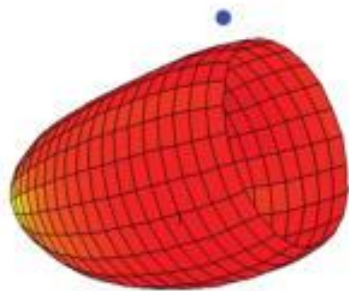
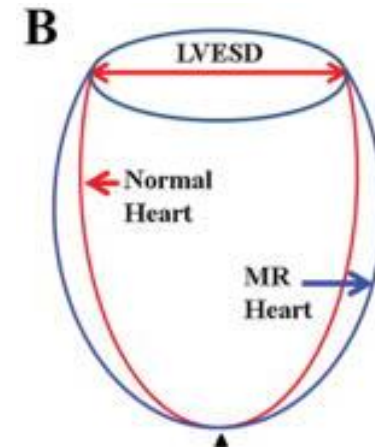
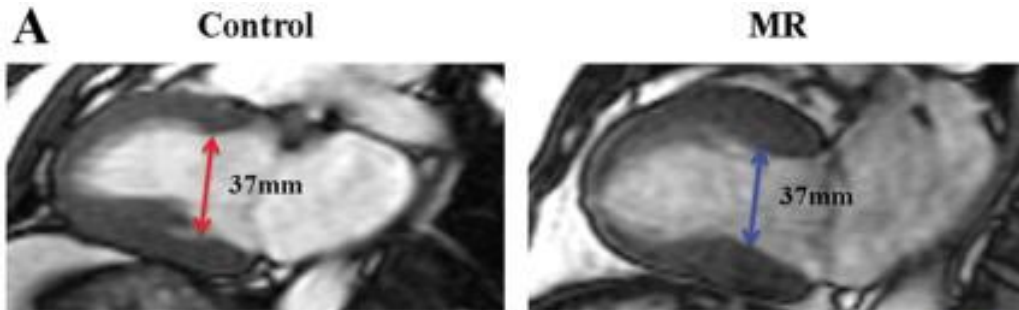
LVEF = Regurgitant fraction + Forward ejection fraction



LV Remodeling in Primary MR

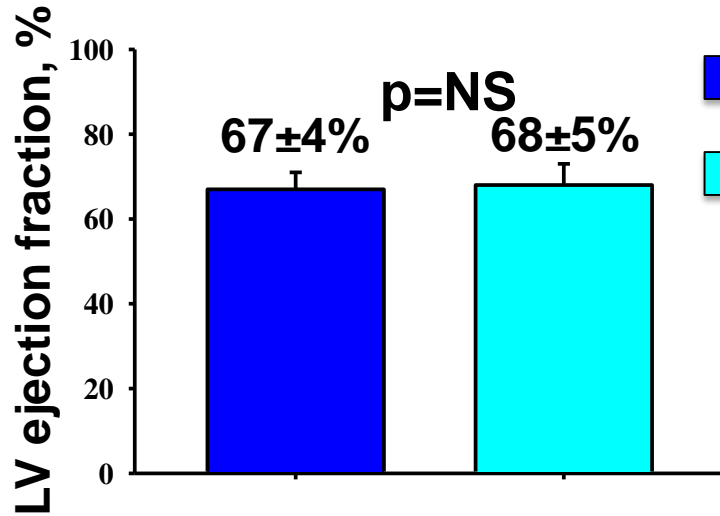
n=94 MR patients, LVEF>60%, LVES d<40mm

Control group: n=51



	Control (n=51)	LVES Dimension <37 mm (n=48)
LVES length, cm	6.81 ± 0.86	6.73 ± 0.87
LVES sphericity index	1.95 ± 0.26	1.82 ± 0.23*
LVES volume index, mL/m ²	25 ± 6	34 ± 9*
2D LV apex curvature, 1/cm ‡	2.93 ± 1.13	1.89 ± 0.48*

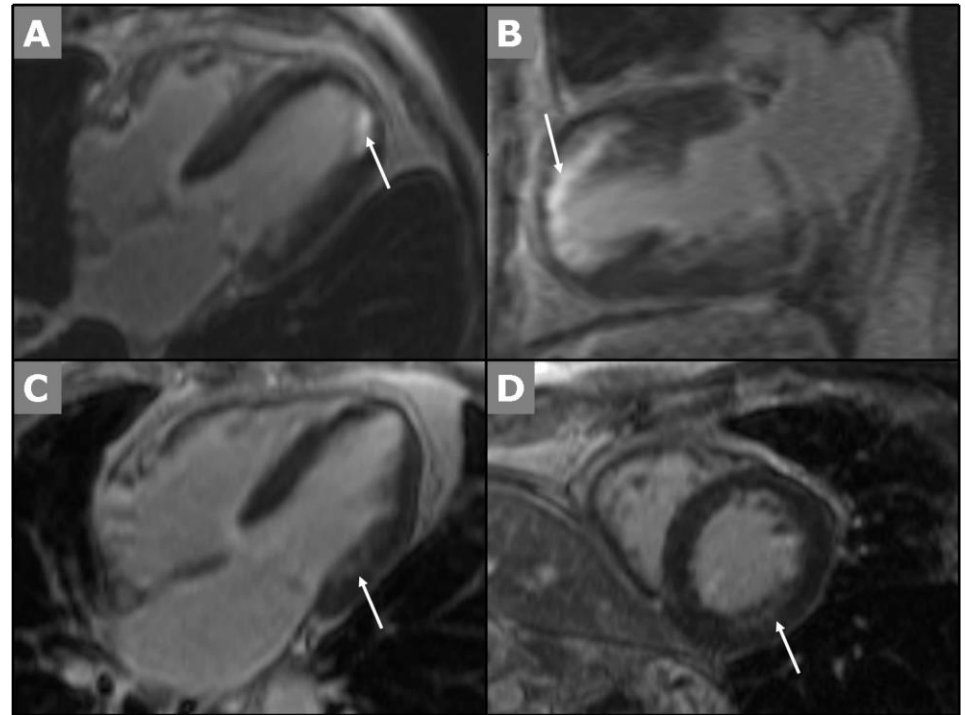
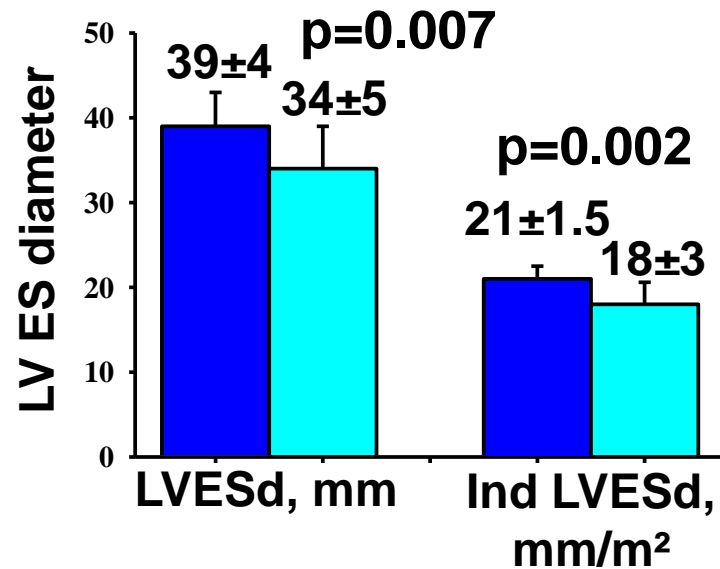
Primary MR and LV Myocardial Fibrosis



■ LV fibrosis (n=11, 30%)

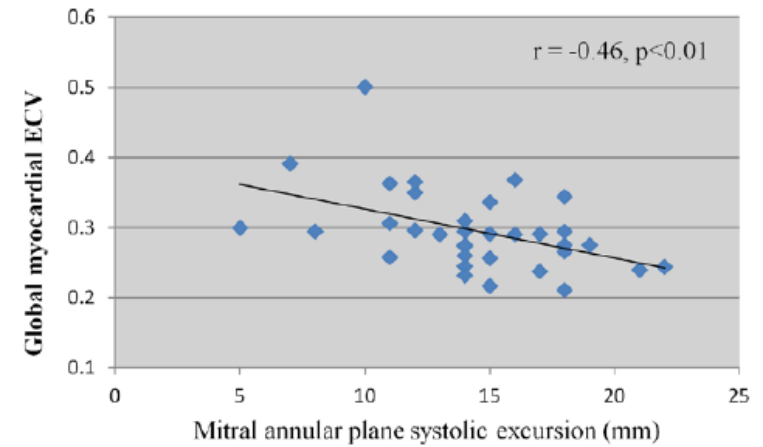
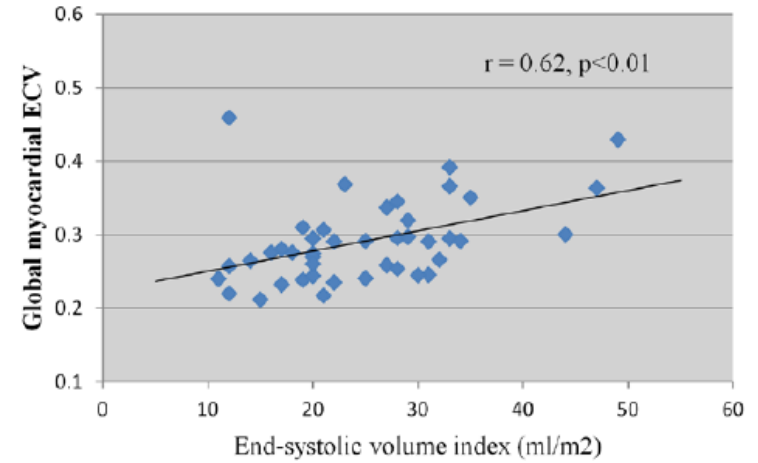
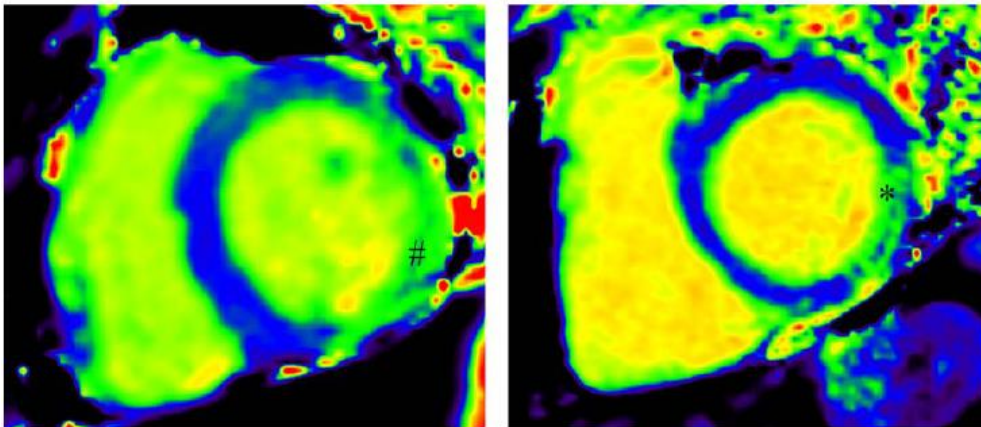
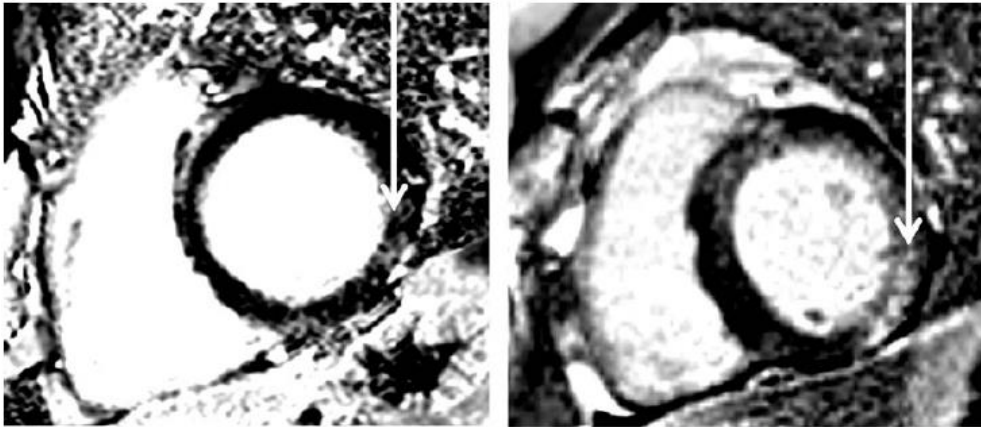
■ No LV fibrosis (n=29, 70%)

n=40 asymptomatic pts, LVEF>60%, LVESd<45mm

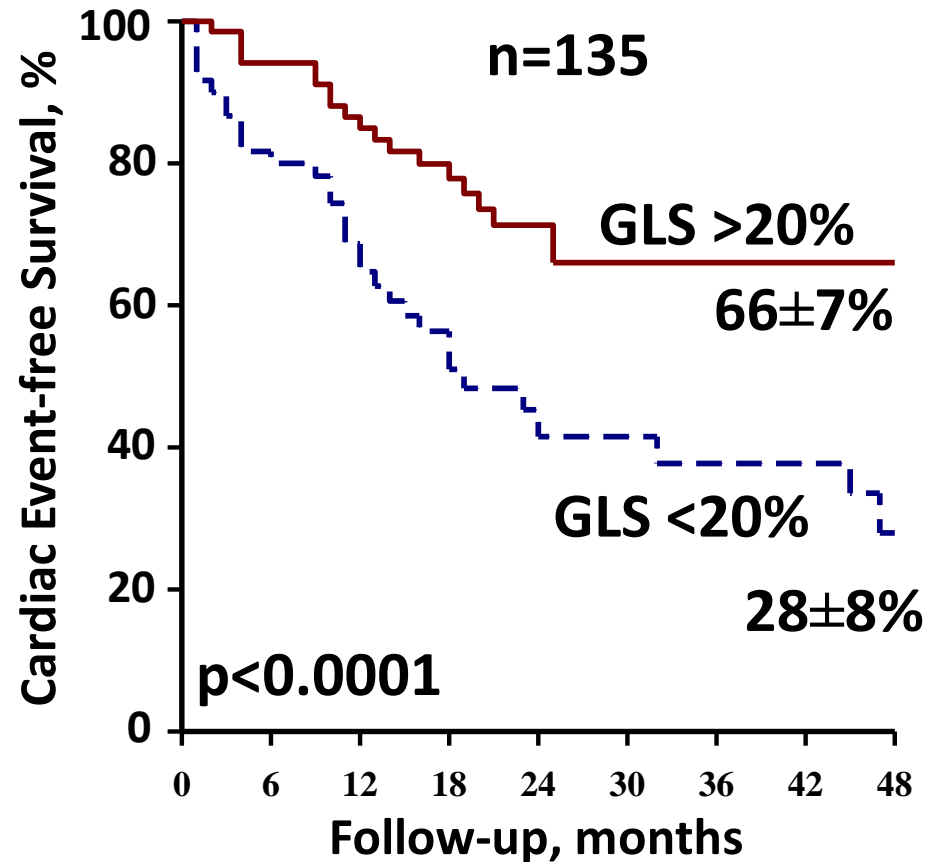


Primary MR and LV Myocardial Fibrosis

n=35 asymptomatic primary MR; 31% of LGE

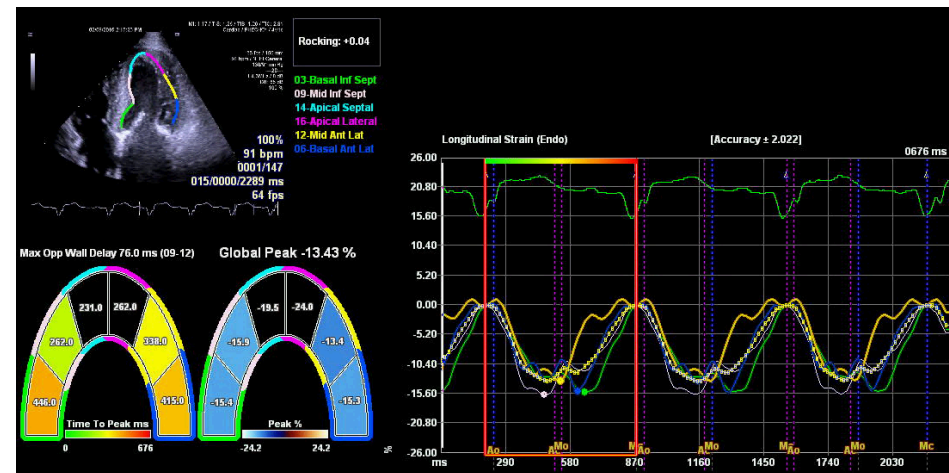
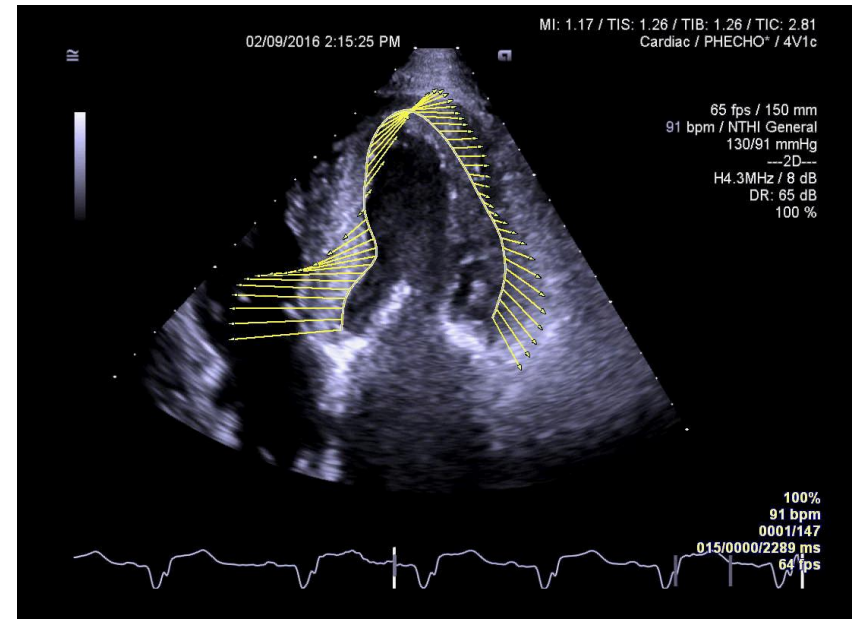


GLS and Outcomes in primary MR



Adjusted HR=3.3 (1.1-9.9) p=0.03

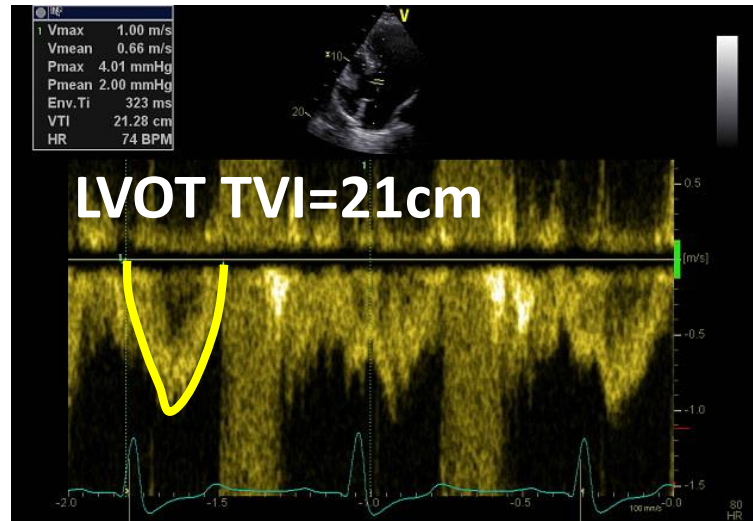
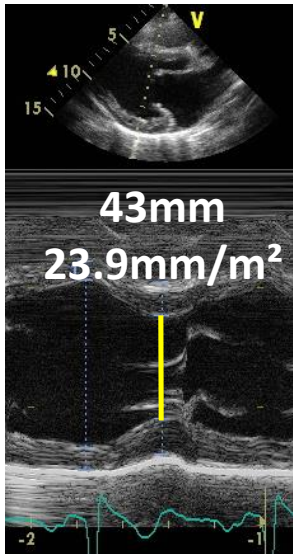
Magne et al. Heart 2012



LV Ejection Index

Composite echo marker of LV dilatation and ejection

$$\text{LV ejection index} = \frac{\text{Indexed LV end - systolic diameter}}{\text{LVOT TVI}}$$



1.14
(Indexed)
= Or
2.04
(non-indexed)

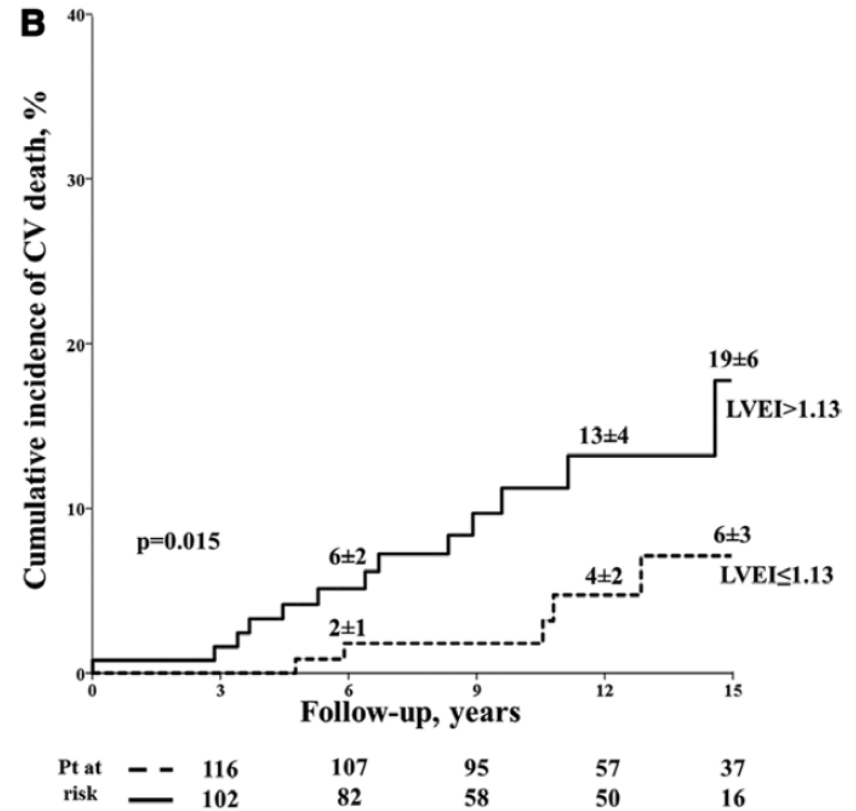
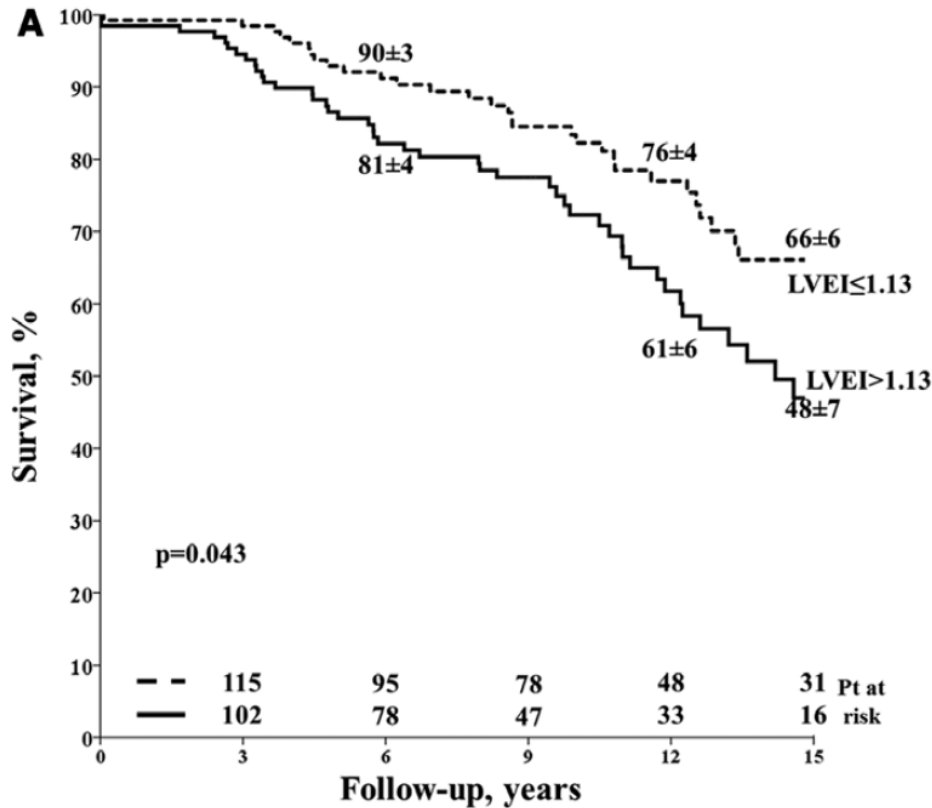
Best Cut-off value= 1.13 (indexed) or 2.35 (non-indexed)

LV Ejection Index

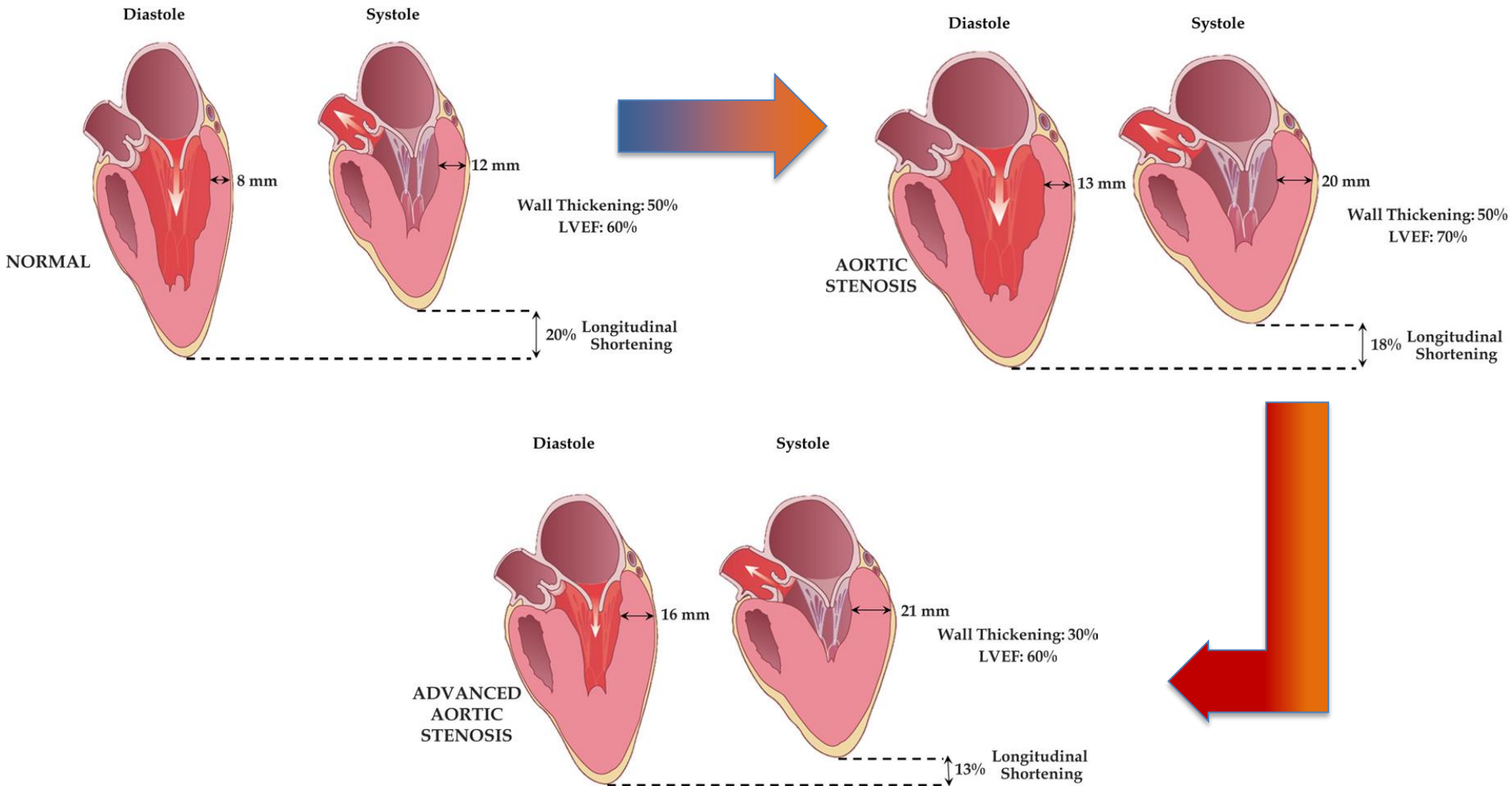
In patients with “normal” LVEF & no LV dilatation

Postop. overall survival

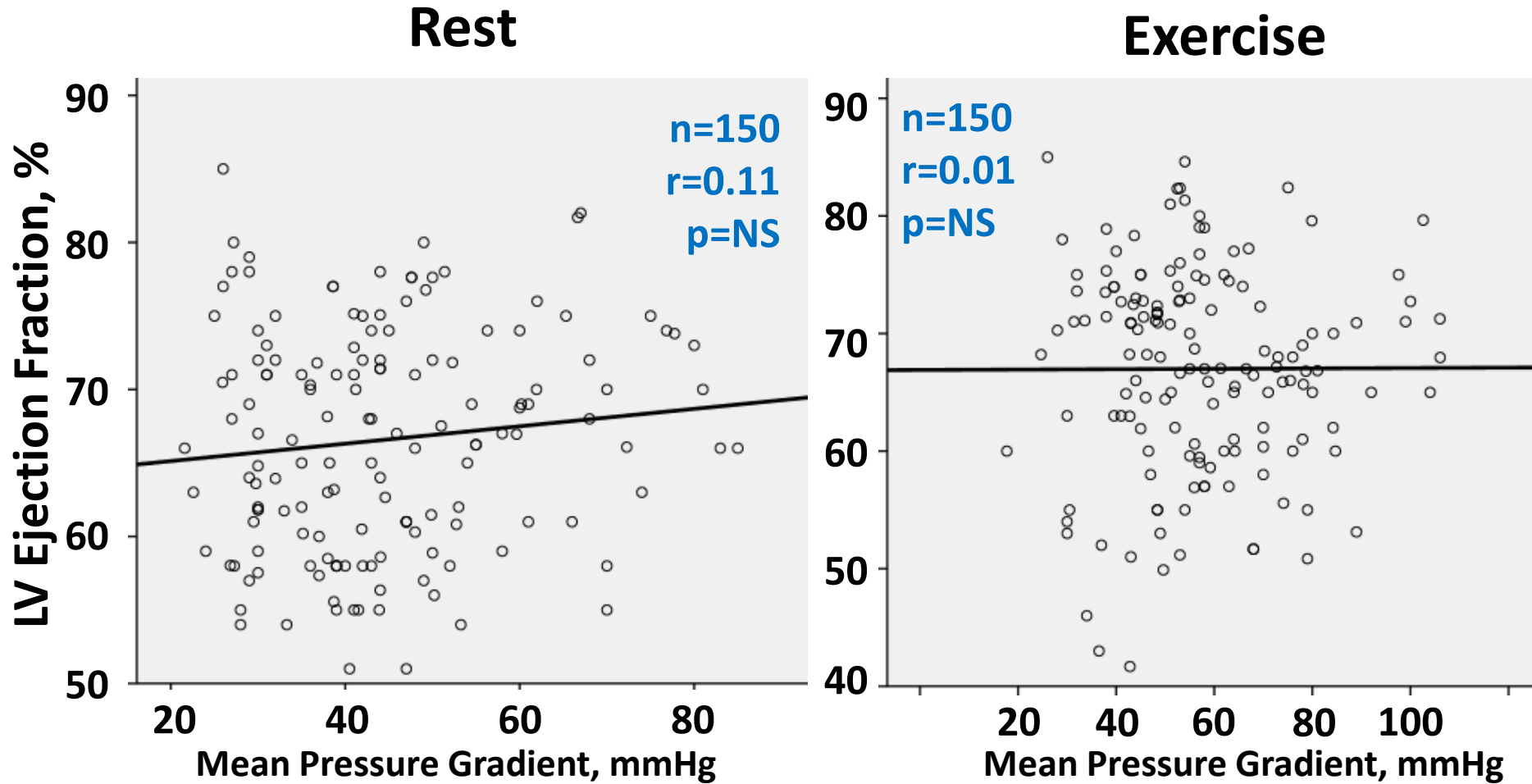
Postop. CV mortality



LV Systolic Function in AS



Relationship between AS Severity and LV Function



Unpublished data, 2013

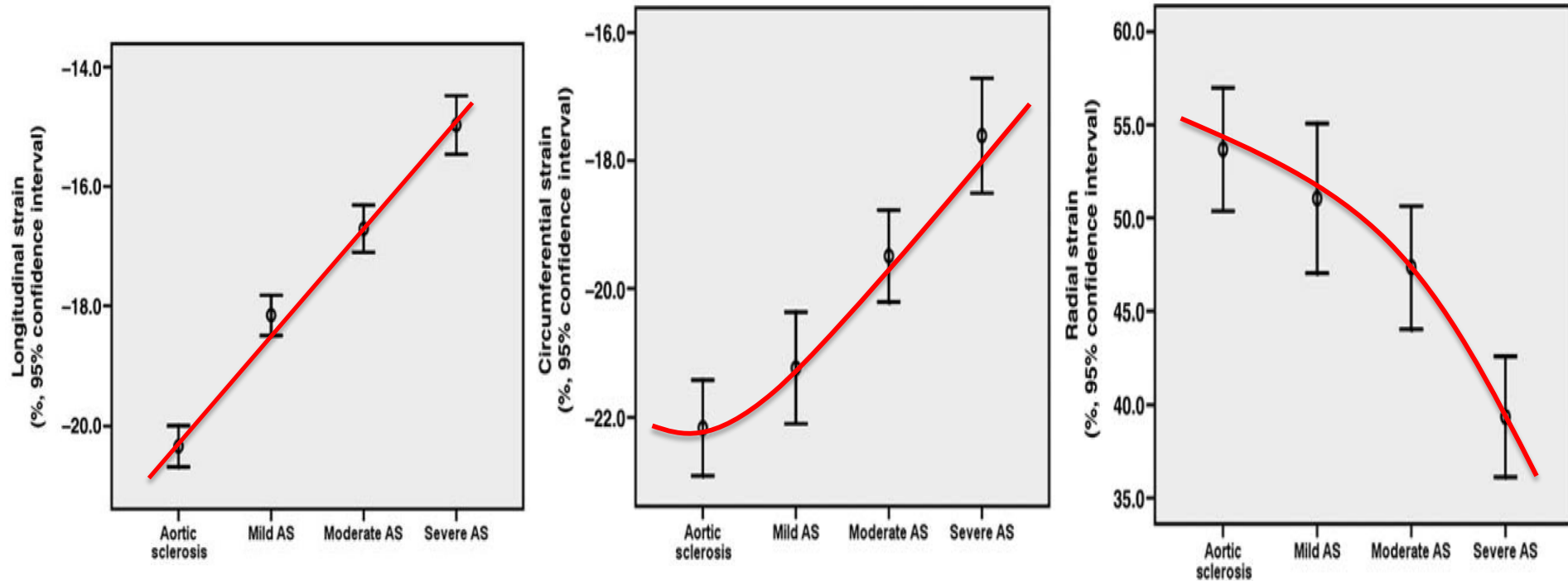
Myocardial Function in AS

Variable	Total population (n = 420)	Aortic sclerosis (n = 118)	Mild aortic stenosis (n = 81)	Moderate aortic stenosis (n = 109)	Severe aortic stenosis (n = 112)
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Demographic characteristics

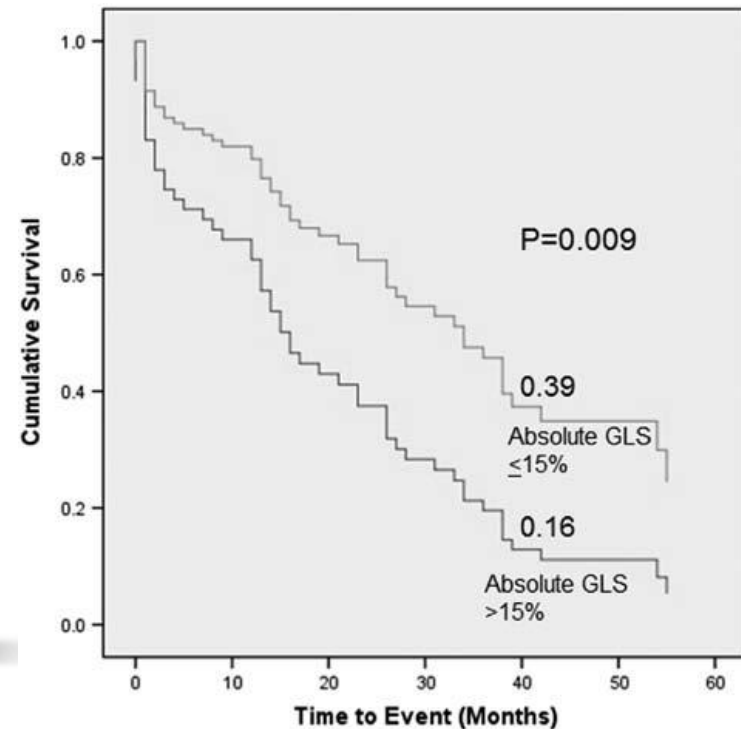
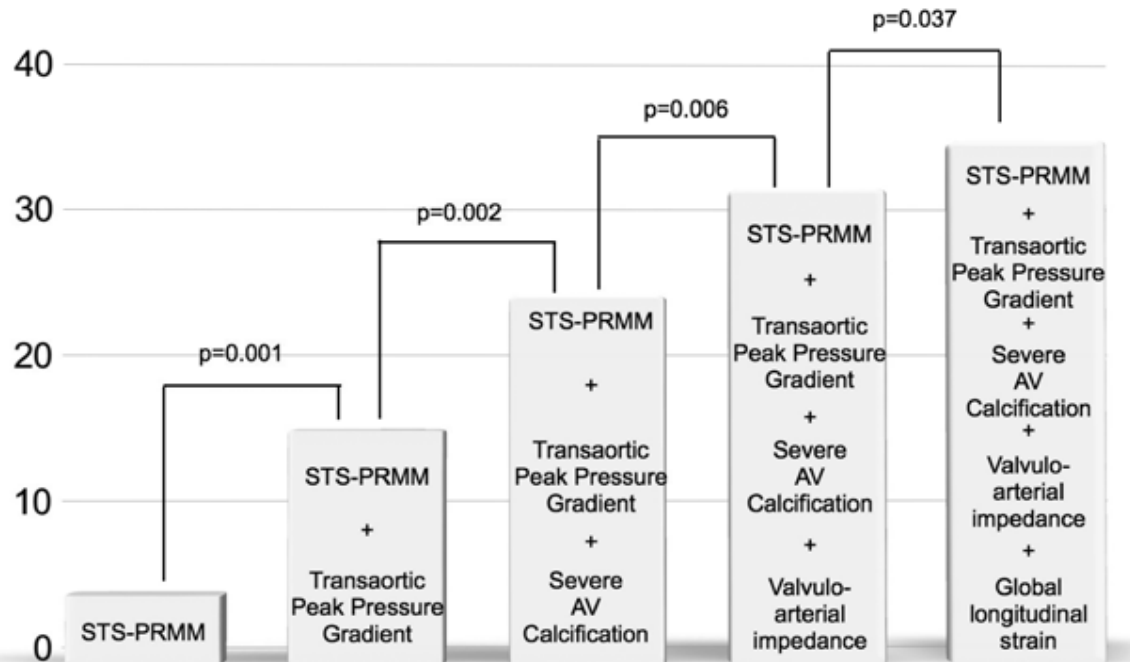
Age, (years)	66.1 ± 14.5	60.8 ± 14.9	67.6 ± 14.2	66.5 ± 15.0	70.2 ± 12.0
Male gender, (%)	60.7	59.3	69.1	61.5	55.4
Body mass index, (kg/m ²)	26.0 ± 4.3	26.0 ± 3.7	25.9 ± 3.8	26.8 ± 5.5	25.3 ± 3.9
Body surface area, (m ²)	1.90 ± 0.21	1.90 ± 0.21	1.92 ± 0.21	1.92 ± 0.21	1.85 ± 0.19

LVEF, % **62±6%** **62±6%** **59±6%** **62±6%** **61±6%**

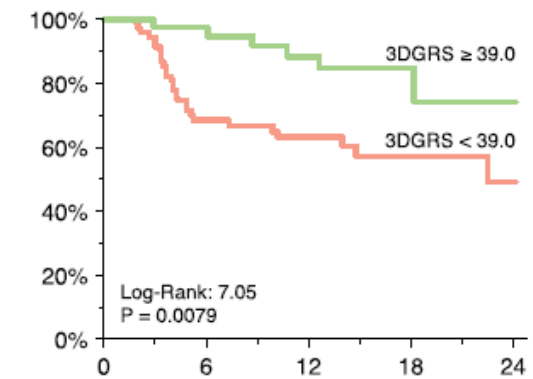
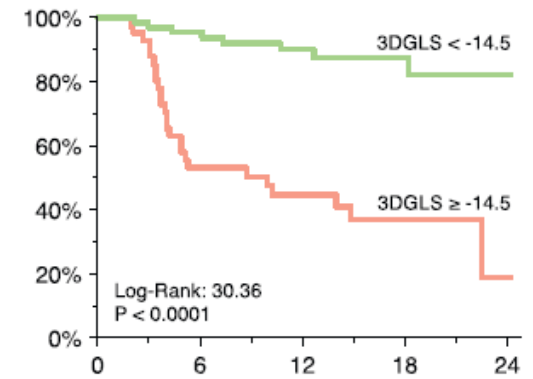
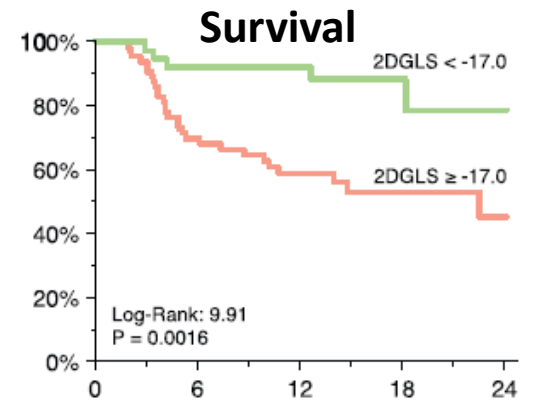
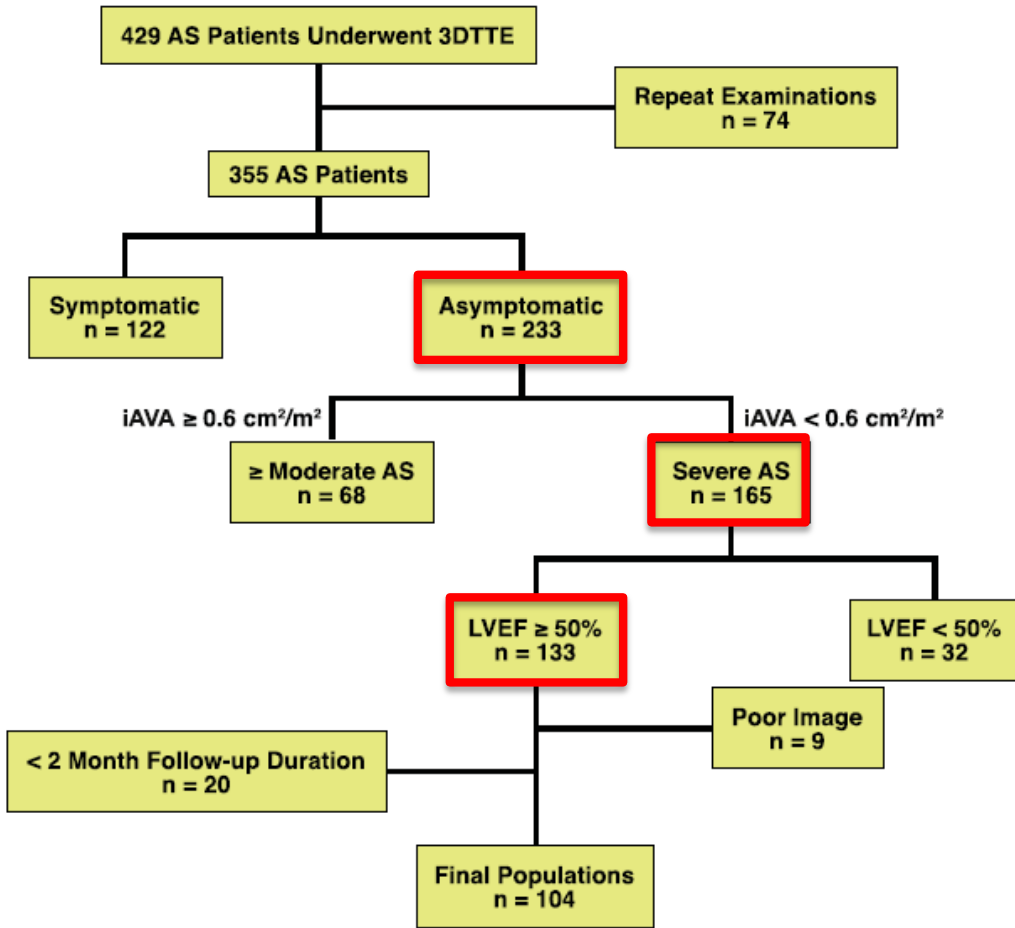


AS and LV function

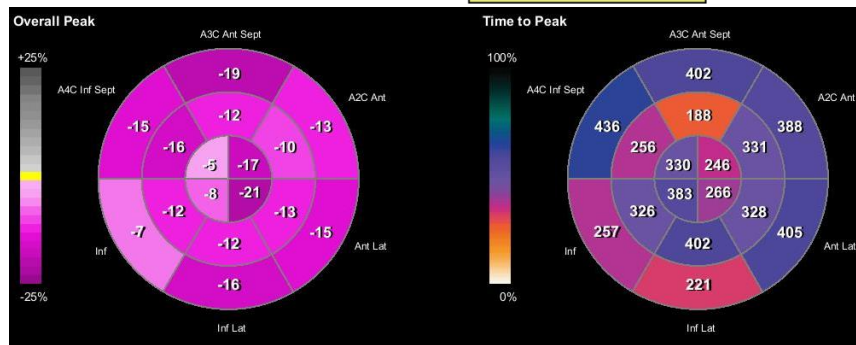
n=79 Asymptomatic severe AS with preserved LV ejection fraction (63±8%)



AS and LV function

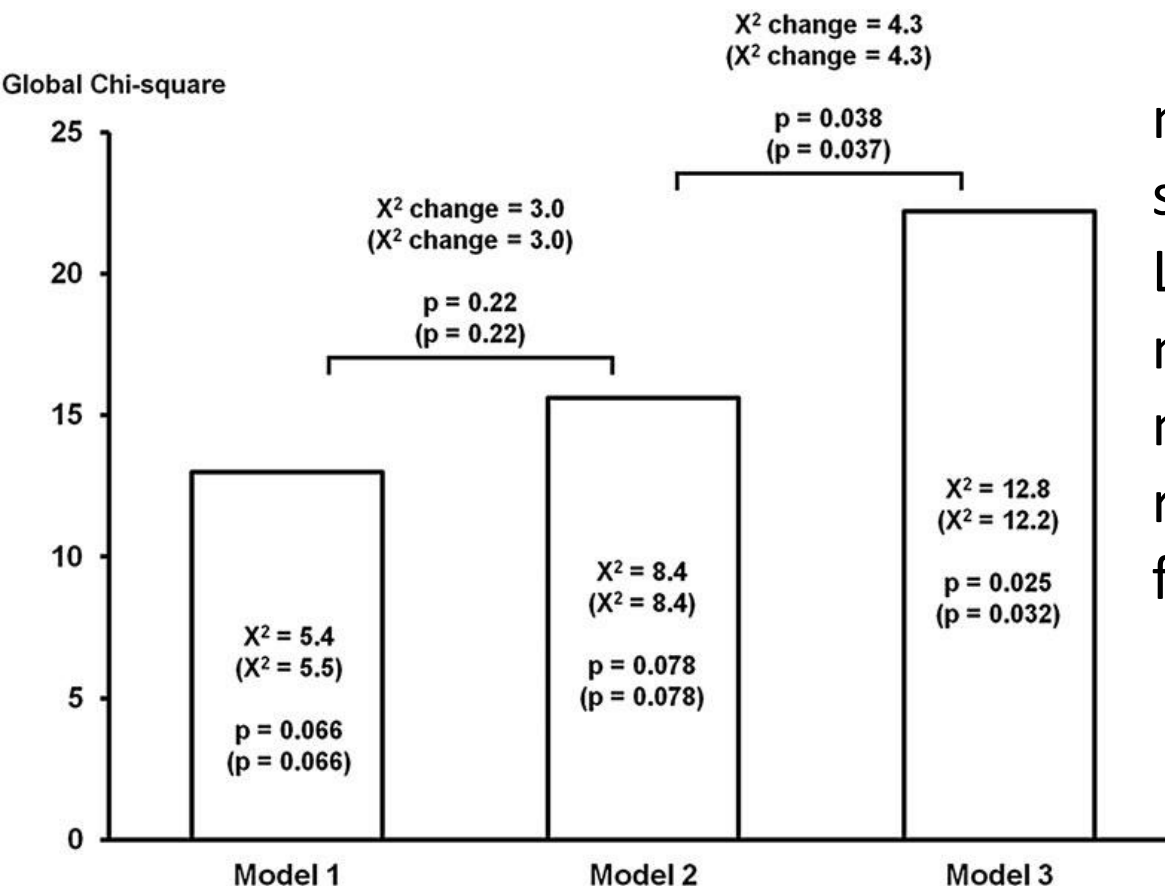


Follow-up Duration (Month)



AR and LV function

	Need AV surgery (n = 26)	No need AV surgery (n = 23)	P-value*
Two-dimensional speckle tracking echocardiography			
LV longitudinal strain (%)	-15.7 ± 2.0	-17.6 ± 2.7	0.009
LV circumferential strain (%)	-18.3 ± 2.4	-20.2 ± 2.9	0.017
LV radial strain (%)	38.6 ± 13.8	43.5 ± 13.2	0.22
LVEF, %	61±5%	62±5%	p=0.50



n=129 patients with significant AR
LVEF>50%.

n=68 asymptomatic
n=26 asymptomatic patients requiring AV surgery during follow-up.

Ewe et al. EHJ CVI, 2015

Take Home Messages!

- **In patients with VHD, LV ejection fraction and dilatation assessments are mandatory!**
- **LV ejection fraction/dilatation is often normal in patients with asymptomatic VHD**
- **Strain imaging is particularly useful in these patients to identify subclinical LV myocardial dysfunction**
- **Nevertheless, appropriate cut-off values still require validation**

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1 - 31 October

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